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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,314	02/06/2004	Shlomo Novotny	SUN.04.142	8526

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EXAMINER	
CHANDRAN, BIJU INDIRA	
ART UNIT	**PAPER NUMBER**
2835	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/774,314	NOVOTNY, SHLOMO	
	Examiner	Art Unit	
	Biju Chandran	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/31/2005, 5/11/20*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because, in figure 2, reference character "202" has been used to designate both "high-temperature indication" and "fluidic circuit". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-5, 7, 8, 11-13, 15-17, 19, 21-23, 26-29, 31-33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (PGPub US 2003/0147216), in view of O'Grady (US Patent 6,170,561).

   - With respect to claim 1, Patel et al. disclose an electronic component system comprising: an enclosure (10); one or more electronic components positioned within the enclosure (22, 24), at least one fan (12a, 12b) positioned within the enclosure for generating an airflow across the one or more electronic components (paragraph 0031), a heat exchanger for cooling the airflow (18a, 18b, paragraph 0026). Patel et al. do not disclose a phase change material for absorbing heat from the airflow upon a failure associated with the heat exchanger. O'Grady (US patent 6,170,561) disclose a back up cooling device for electronic components comprising a phase change material for absorbing heat from the airflow upon a cooling system failure associated with electronic component systems. It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a system for permitting orderly shutdown of electronic components by incorporating the phase change material taught by O'Grady in the electronic component system disclosed by to Patel et al., so as to provide repair time by delaying electronic component failure after cooling system failure (O'Grady, column 2, lines 25-30).

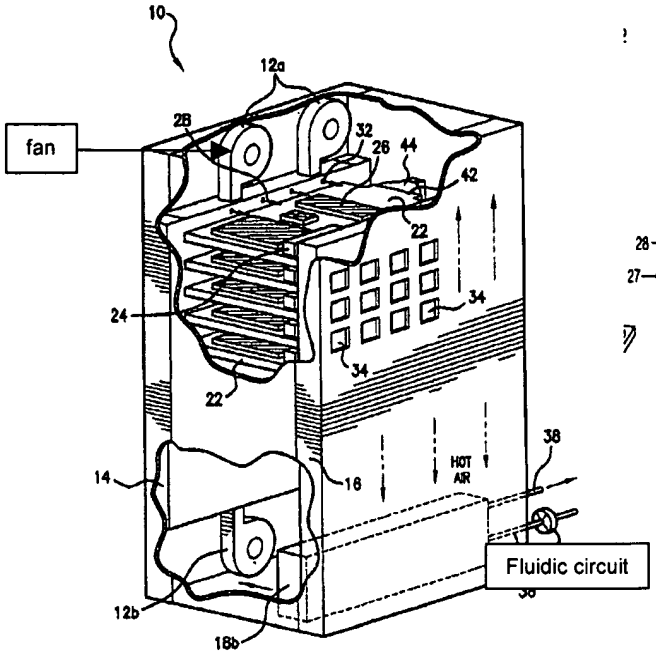


FIG.2

Patel et al.
(2003/0147216)

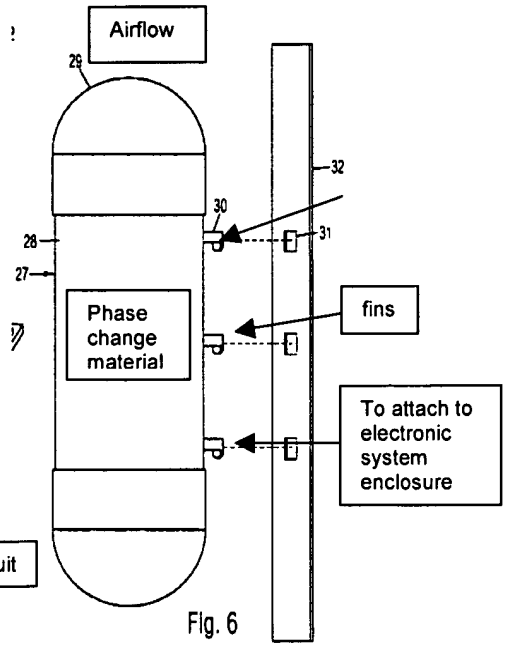


Fig. 6

O'Grady
(6,170,561)

- With respect to claim 2, O'Grady further discloses that the phase change material has a phase change temperature that is above a temperature of the airflow when there is no failure associated with the heat exchanger, and below a maximum operating temperature of the one or more electronic components (O'Grady, column 4, lines 50-60).
- With respect to claim 3, Patel et al. further discloses that the heat exchanger is a fluid to air heat exchanger (Patel et al., Paragraph 0026).

- With respect to claim 4, Patel et al. further discloses that the fluid to air heat exchanger is coupled to a fluidic circuit (Patel et al., Paragraph 0028).
- With respect to claim 5, Patel et al. further discloses that the fluidic circuit circulates one of a refrigerant and water (Patel et al., Paragraph 0028).
- With respect to claim 7, O'Grady further discloses that the phase change material is enclosed in a heat conductive container (O'Grady, column 2, lines 21-22).
- With respect to claim 8, O'Grady further discloses that the container includes fins (O'Grady, Fig 6, "30").
- With respect to claim 11, Patel et al. further discloses a temperature sensor for sensing temperature within the enclosure; and a high temperature indication indicative of a high temperature within the enclosure (Patel et al., Paragraphs 0033-0035), the high temperature being lower than a phase change temperature of the phase change material (O'Grady, lines 50-55).
- With respect to claim 12, O'Grady further discloses that the phase change material is a material chosen from the group of materials consisting of a paraffin, a hydrated salt, a metal, an alloy, and an organic acid (O'Grady, column 6, line 20).

- With respect to claim 13, Patel et al. further discloses at least one fan (12a, 12b) that recirculates air within the enclosure (Patel et al., paragraph 0025).
- With respect to claim 15, Patel et al. disclose a method of cooling one or more electronic components positioned in an enclosure, comprising: providing an air cooling element (18a, 18b, paragraph 0026) within the enclosure (10); generating an airflow (paragraph 0031) across the cooling element and one or more electronic components (22, 24) positioned within the enclosure. Patel et al. do not disclose cooling the airflow using a phase change material positioned within the enclosure. O'Grady disclose a phase change material for absorbing heat from the airflow in enclosures of electronic component systems. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the phase change material taught by O'Grady in the electronic component system disclosed by to Patel et al., so as to provide repair time by delaying electronic component failure after cooling system failure (O'Grady, column 2, lines 25-30).
- With respect to claim 16, Patel et al. further discloses that the air-cooling element includes moving fluid through a fluidic circuit (Patel et al., paragraph 0028). The fluidic circuit includes a fluid to air heat exchanger (Patel et al., paragraph 0026).

- With respect to claim 17, Patel et al. further discloses that the fluidic circuit is pumped with water and a refrigerant (Patel et al., paragraph 0028).
- With respect to claim 19, Patel et al. further discloses capability of indication indicative of a high temperature condition within the enclosure.
- With respect to claim 21, O'Grady further discloses that the phase change material has a melting point that is above a temperature of the airflow when there is no failure in the air cooling element, and below a maximum operating temperature of the one or more components (O'Grady, Column 4, line 51-60).
- With respect to claim 22, O'Grady further discloses that the phase change material is enclosed in a container (O'Grady, "11").
- With respect to claim 23, O'Grady further discloses that the phase change material is encapsulated in a surface positioned within the airflow (O'Grady, column 2, lines 10-20; column 5, lines 25-30).
- With respect to claim 26, Patel et al. disclose a cooling system comprising of an enclosure (10), one or more electronic components positioned in the enclosure (22, 24); means for generating an airflow (12a, 12b) across the one or more electronic components, cooling means for cooling the airflow (18a, 18b, paragraph 0026). Patel et al. do not explicitly disclose a phase change material positioned in the

airflow. O'Grady discloses a phase change material for absorbing heat from the airflow upon a failure in the cooling means, positioned in the airflow. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the phase change material taught by O'Grady in the electronic component system taught by Patel et al., so as to provide repair time by delaying electronic component failure after cooling system failure (O'Grady, column 2, lines 25-30).

- With respect to claim 27, Patel et al. further discloses that the means for generating the airflow includes a fan (12a, 12b).
- With respect to claim 28, Patel et al. further discloses that the cooling means includes a fluid to air heat exchanger (Patel et al., Paragraph 0026).
- With respect to claim 29, Patel et al. further discloses that the fluid to air heat exchanger is coupled to a fluidic circuit that circulates one of a refrigerant and water (Patel et al., paragraph 0028).
- With respect to claim 31, O'Grady further discloses that the phase change material is enclosed in a container (O'Grady, "11").
- With respect to claim 32, O'Grady further discloses that the container includes fins (O'Grady, Fig 6, "30").

- With respect to claim 33, O'Grady further discloses that the phase change material is encapsulated in a surface positioned within the airflow (O'Grady, column 2, lines 10-20; column 5, lines 25-30).
- With respect to claim 35, O'Grady further discloses that the phase change material is a material chosen from the group of materials consisting of a paraffin, a hydrated salt, a metal, an alloy, and an organic acid (O'Grady, column 6, line 20).

2. Claims 6, 18 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. in view of O'Grady as applied above, and further in view of Meir (PGPub 2002/0191430).
   - Regarding claim 6, the system as disclosed by Patel et al., and modified by O'Grady satisfies all the limitations of claim 1. Patel et al. do not disclose the heat exchanger to be a thermoelectric device. Meir teaches a thermoelectric device heat exchanger. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the thermoelectric device heat exchanger taught by Meir in the electronic component system disclosed by Patel et al., to improve the efficiency of the cooling system (Meir, Paragraph 0018).
   - Regarding claim 18, the system as disclosed by Patel et al., and modified by O'Grady satisfies all the limitations of claim 15. Patel et al. does not explicitly disclose that the air-cooling element is a

thermoelectric device. Meir teaches an air-cooling element which is a thermoelectric device. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the thermoelectric device air cooler taught by Meir in the electronic component system disclosed by Patel et al., to improve the efficiency of the cooling system (Meir, Paragraph 0018).

- Regarding claim 30, the system as disclosed by Patel et al., and modified by O'Grady satisfies all the limitations of claim 26. Patel et al. do not disclose the cooling means to be a thermoelectric device. Meir teaches a thermoelectric device cooling means. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the thermoelectric device cooling means taught by Meir in the electronic component system disclosed by Patel et al., to improve the efficiency of the cooling system (Meir, Paragraph 0018).

3. Claims, 9, 10, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. in view of O'Grady as applied above and further in view of Fitch et al. (US Patent 6,317,321 B1).

- Regarding claim 9, Patel et al. do not disclose the phase change material to be in micro-encapsulated form that is embedded in a coating applied to one or more of the surfaces within the enclosure. Fitch et al. disclose a phase change material in micro-encapsulated

form that is embedded in a coating applied to one or more surfaces within an electronic system enclosure (Fitch et al., figure 8, column 5, lines 4-7). At the time the invention was made, it would have been obvious to one of ordinary skill in the art, to incorporate the micro-encapsulated phase change material coated on multiple surfaces of the enclosure as taught by Fitch et al., on the system as taught by Patel et al., to make utilize the additional cooling capabilities of the micro-encapsulated surface coating without a significant increase in weight, size and cost (Fitch et al., column 3, lines 10-15).

- With respect to claim 10, Fitch et al., further disclose that the phase change material is encapsulated by a sealing coat (Fitch et al., column 5, lines 1-2).
- With respect to claim 34, the system as disclosed by Patel et al. as modified by O'Grady and Fitch et al., satisfies all the limitations of claim 26. Fitch et al., further discloses that one or more surfaces within the enclosure is coated with the phase change material (Fitch et al., figure 8, column 5, lines 4-7), and that the phase change material is encapsulated by a sealing coat (Fitch et al., column 5, lines 1-2).

4. Claims 14, 25 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (PGPub US 2003/0147216) in view of

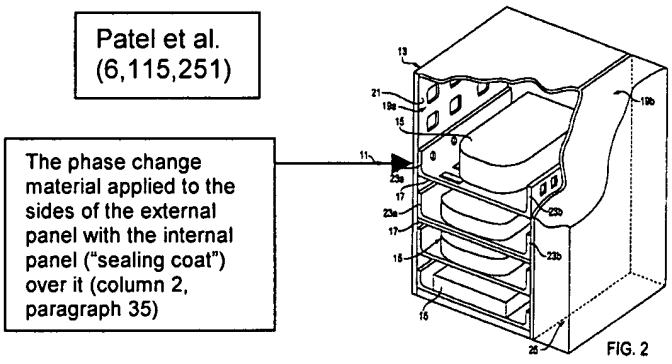
O'Grady as applied above, as further in view of Patel et al. (PGPub US2004/0264124).

- With respect to claim 14, the system as disclosed by Patel et al. '16, and modified by O'Grady satisfies all the limitations of claim 1. Patel et al. '16 do not explicitly disclose that one of the electronic components is a blade server. Patel et al. '24 discloses a cooling arrangement for an electronic component system comprising blade servers (Patel et al., '24, "701-712" figure 7, paragraph 0077). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the blade servers taught by Patel et al. '24 in the system as disclosed by Patel et al. '16, to efficiently cool the blade servers.
- With respect to claim 25, the system as disclosed by Patel et al. '16, and modified by O'Grady satisfies all the limitations of claim 15. Patel et al. '16 do not explicitly disclose that one of the electronic components is a blade server. Patel et al. '24 discloses a cooling arrangement for an electronic component system comprising blade servers (Patel et al., '24, "701-712" figure 7, paragraph 0077). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the blade servers taught by Patel et al. '24 in the system as disclosed by Patel et al. '16, to efficiently cool the blade servers.

- With respect to claim 36, the system as disclosed by Patel et al. '16, and modified by O'Grady satisfies all the limitations of claim 26. Patel et al. '16 do not explicitly disclose that one of the electronic components is a blade server. Patel et al. '24 discloses a cooling arrangement for an electronic component system comprising blade servers (Patel et al., '24 "701-712" figure 7, paragraph 0077). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the blade servers taught by Patel et al. '24 in the system as disclosed by Patel et al. '16, to efficiently cool the blade servers.

5. Claim 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al., in view of O'Grady as applied above, and further in view of Schwabl (US Patent 5,714,938). The system as disclosed by Patel et al., and modified by O'Grady satisfies all the limitations of claim 15. Patel et al. do not explicitly disclose means of shutting down one or more electronic components upon failure in the fluidic circuit. Schwabl teaches a means of shutting down one or more electronic components upon failure in the fluidic circuit in an electronic component system (Schwabl, abstract, figure 1, "11"). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the electronic component shut down device taught by Schwabl, in the electronic

component system disclosed by Patel et al., to prevent overheating damage to the electronic components (Schwabl, column 1, line 55).



6. Claim 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (PGPub US 2003/0147216) in view O'Grady as applied above, and further in view of Patel et al. (US Patent 6,115,251). The system as disclosed by Patel et al. '16, and modified by O'Grady satisfies all the limitations of claim 15. Patel et al. '16 do not explicitly disclose applying the phase change material to a surface positioned within the airflow and applying a sealing coat on top of the phase change material. Patel et al. '51 disclose an electronic component system with the phase change material (Patel et al., '51, abstract) applied to a surface positioned within the airflow with a sealing coat on top of the phase change material. It would have been obvious to one of ordinary skill in the art at the time the invention was made, to incorporate the phase change material and sealing coat Patel et al. '51 in the electronic component system disclosed by Patel

et al. '16, to reduce the overall size of the electronic component system (Patel et al., '51, Column 2, lines 15-25).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Biju Chandran whose telephone number is (571) 272-5953. The examiner can normally be reached on 8AM - 5PM. Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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